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(56) Documents Cited

US 4191450 A

(58) Field of Search

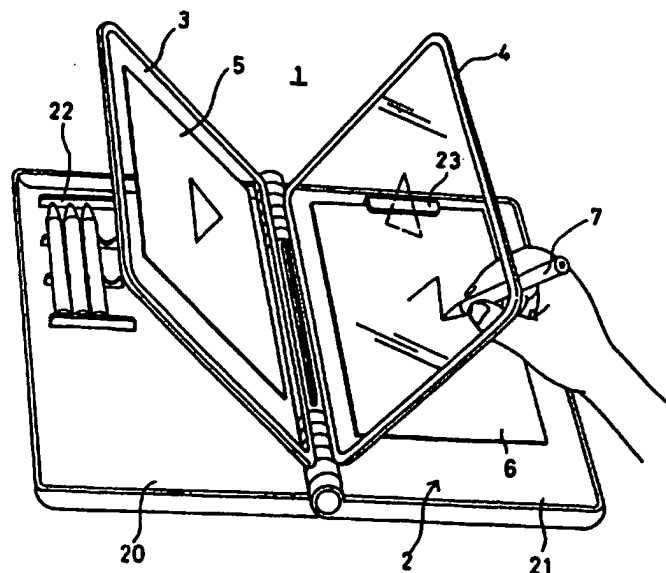
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(54) A device to copy an image eg a pattern, by reflection.

(57) An image or pattern copying device comprises a plate 3 for supporting an original paper 5 and a transparent window plate 4 hinged to a base 2, in the form of cover portions 20, 21. The window plate reflects an image off the original paper onto another paper 6 on the base cover portion 21 such that the reversed image can be copied by hand. The hinge allows the plates and cover portions to be folded together, and also has engaging mechanisms (94a, 94b, 95a, 95b, 96a, 96b and 97a, 97b, Fig 3) in association with a spring (S) for holding the plates 4, 5 at an angle of 60 degrees relative to each other and to the cover portions 20, 21.

FIG. 2



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FIG. 1

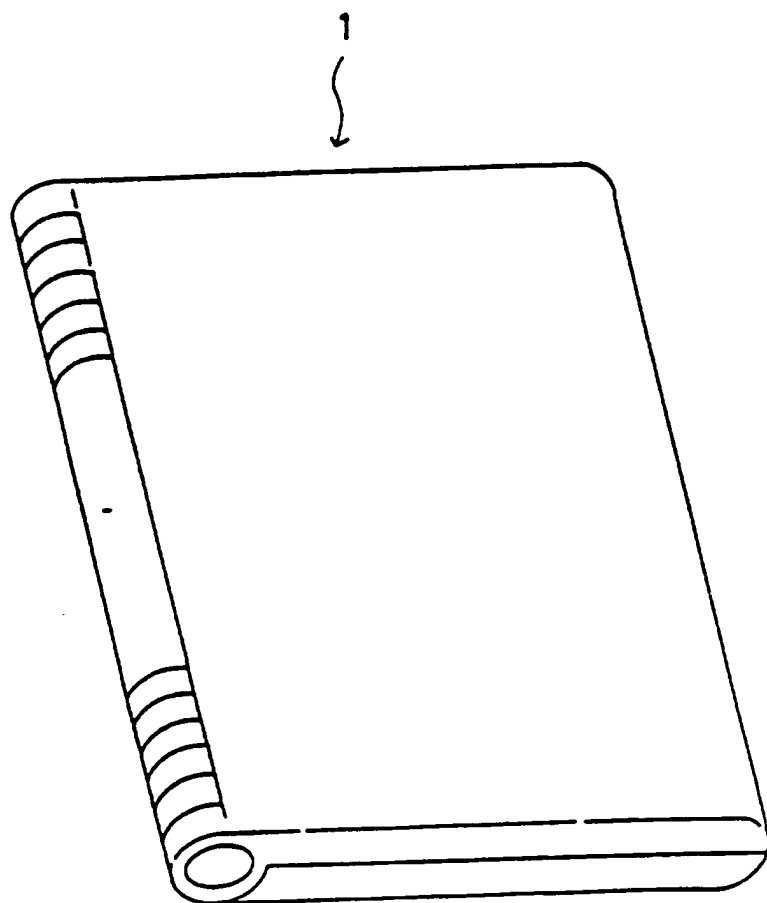


FIG. 2

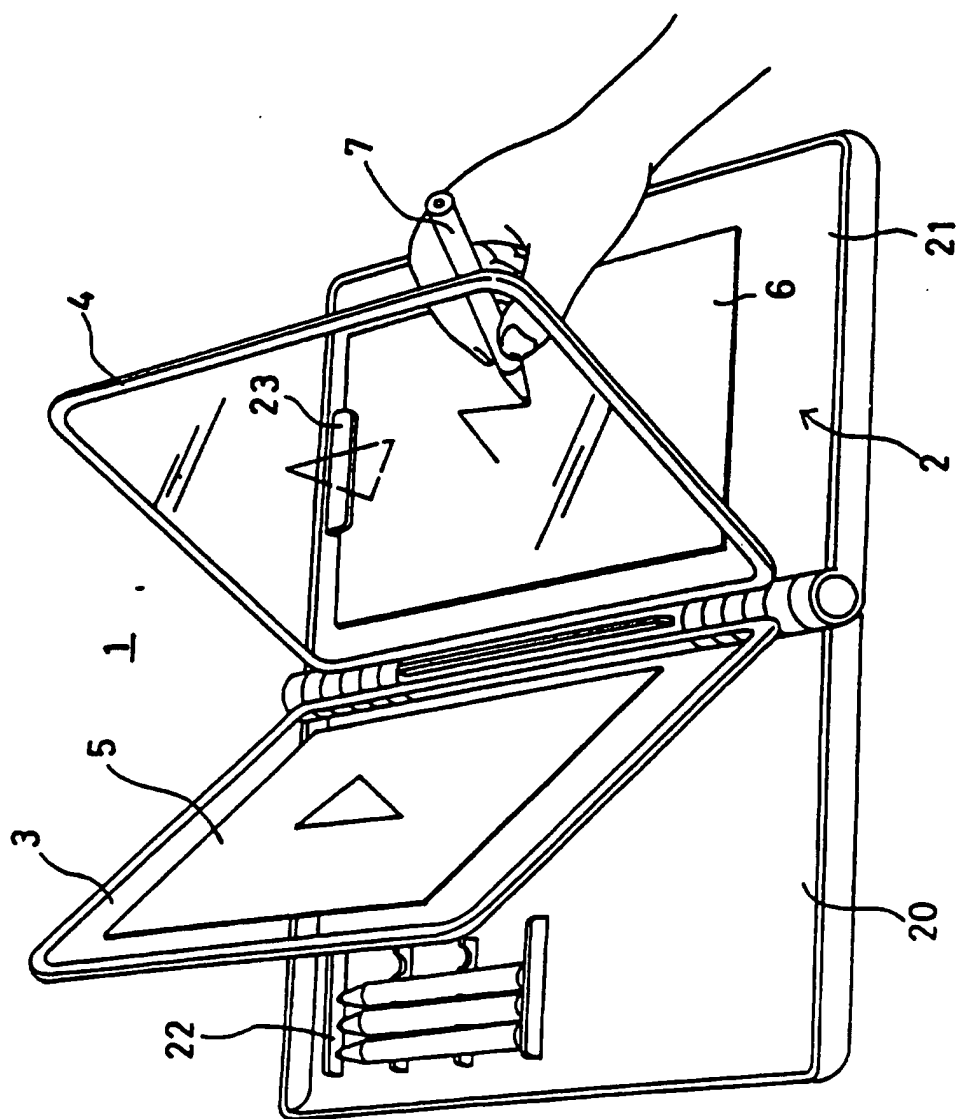
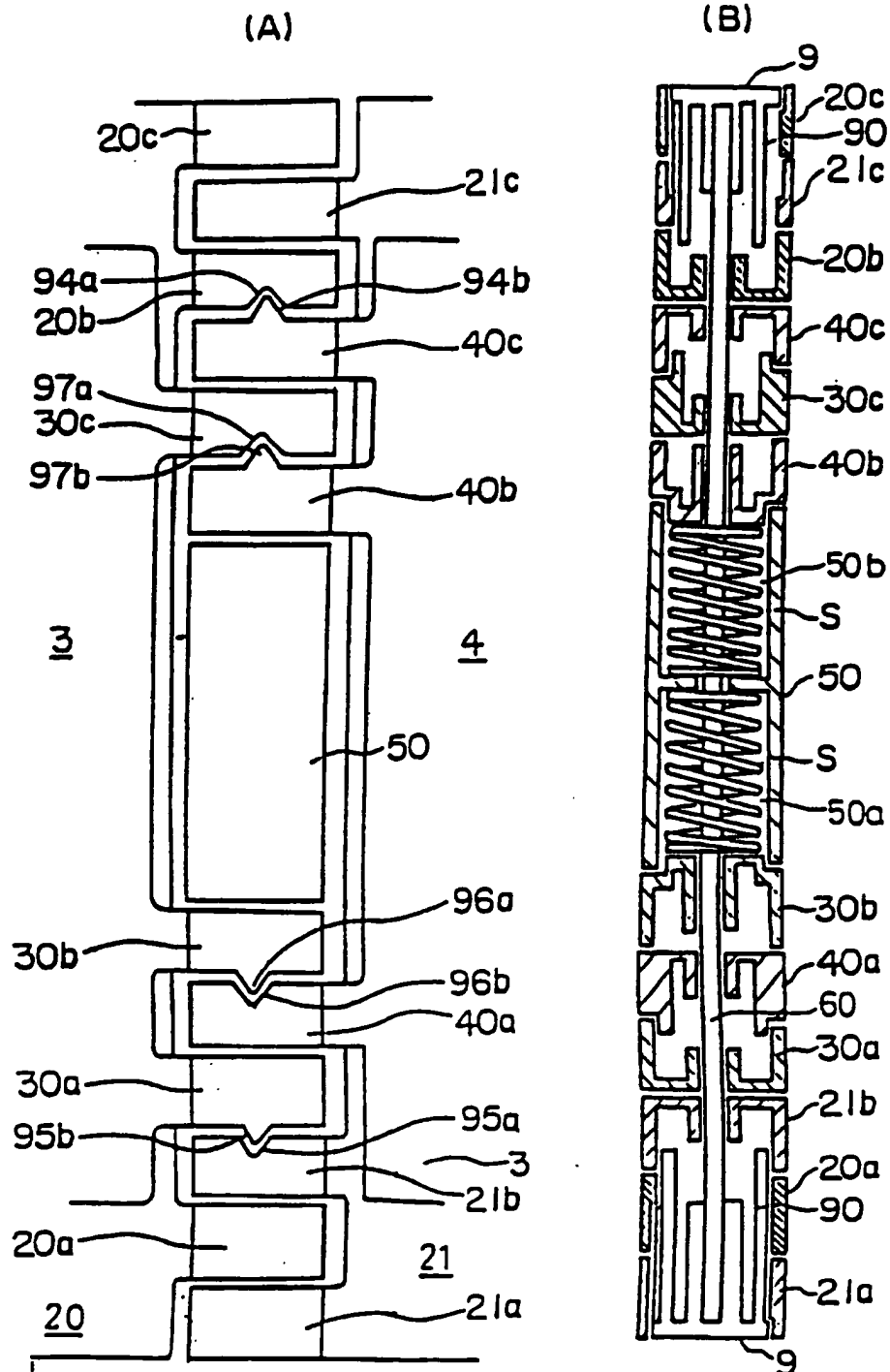


FIG. 3

FIG. 3



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FIG. 4

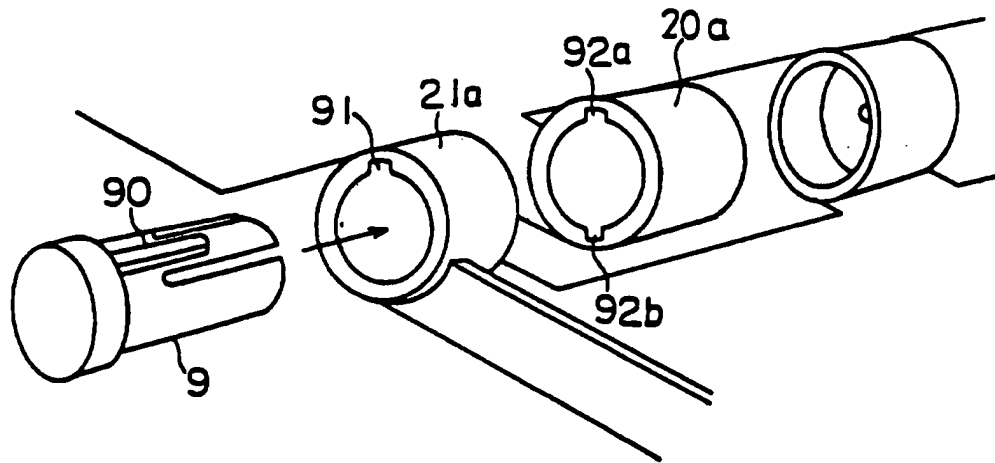


FIG. 5

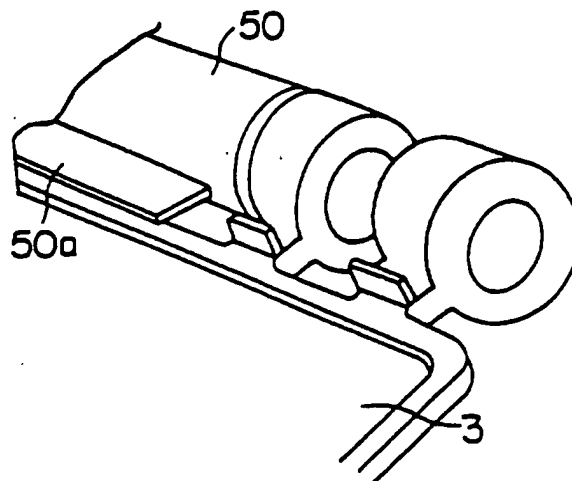
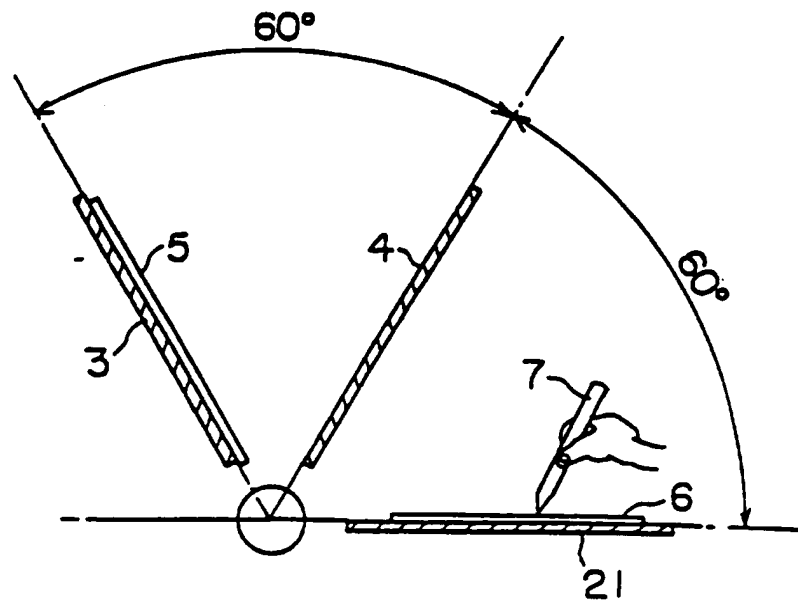


FIG. 6



DESCRIPTION**TRANSFERRING DEVICE**

The present invention relates to a device with special appeal to children whereby a pattern may be transferred from an original rendering to another medium, for example, from a magazine to a blank piece of paper.

U.S. patent 3,819,251 is exemplary of prior transferring mechanisms and features double clips for positioning and holding the supporting plate and window plate in their desired position. With such a double clip construction the supporting plate and the window plate protrude a substantial distance out of the base plate when the device is stowed away during non-use. Removal of the supporting plate and window plate from the clips is therefore required as a practical matter. This means that when the transferring device is used once again the supporting plate and the window plate must be attached to the clips. In addition, in prior art transferring devices such as noted above, a fixing member and a clamping member in the form of clips are fixedly disposed on the base plate and also protrude therefrom a considerable distance, such that it is hard to package and store away the unit.

In contrast, in the transferring device of the present invention, the supporting plate, the window plate and the base plate are connected through hinges permitting opening and closing of the support plate and the window plate when not in use. An automatic engaging mechanism is employed to raise and hold the supporting plate and window plate when in use. In the manner the transferring device of the present invention may be easily folded as a unit and stored for future use.

The invention will now be described by way of example, with reference to the accompanying drawings which show a preferred embodiment of the invention, and in which

Fig. 1 is a perspective view of the transferring device of the present invention with the supporting and window plates folded in closed position;

Fig. 2 is a perspective view of the transferring device with the supporting and window plates in open position illustrating usage thereof;

Fig. 3A is a plan view of the hinge connection portion;

Fig. 3B is a cross sectional view of the hinge connection portion;

Fig. 4 is an exploded perspective view of an end of the hinge connection;

Fig. 5 is a perspective view of an element of the hinge connection; and

Fig. 6 is a schematic view illustrating the angular relationship between the supporting plate and the window plate when the transferring device of the present invention is in use.

Referring now to the drawings:-

The transferring device of the present invention is generally depicted in Figs. 1 and 2 and consists of a base plate 2, a supporting plate 3 and a window plate 4 movably mounted about hinges. It will be apparent from Fig. 2 that the transferring device of the present invention is configured as a book. The book is in closed position in Fig. 1 and in open position in Fig. 2. In accordance with the present invention, the pattern of the original paper 5 is adapted to be transferred onto the paper 6 by mounting the original paper 5 on the surface of the supporting plate 3 while mounting blank paper 6 on the base plate 2 and thereafter tracing the image that is reflected at the rear face of the window plate with the writing instrument 7

while looking at the image of the original plate 5 which is reflected on the surface of the window plate 4. It will be apparent that the pattern transferred on the paper 6 is the reverse of the pattern on the original paper 5.

As seen in Fig. 2, the base plate 2 rotatably mounts the supporting plate 3 and the window plate 4 while covering same in the same manner that the covers of a book cover the pages thereof. The base plate 2 consists of left and right cover bodies 20 and 21. There is further provided a holder 22 on the inner face of the left cover body 20 for the various writing instruments such as pencils and ball-point pens 7.

Clips 23, for holding the original paper 6, are positioned on the inner face of the right cover body 21. Moreover, the cover bodies 20 and 21 are each provided with knuckles 20a, 20b and 20c and 21a, 21b and 21c, respectively, as seen in Fig. 3A. These knuckles are connected by hinges at portions thereof between the supporting plate 3 and the window plate 4. When the cover bodies 20 and 21 are in closed position as seen in Fig. 1 the supporting plate 3 and the window plate 4 are conveniently stored within the cover bodies 20 and 21.

The supporting plate 3, which mounts the original paper 5, is made of a hard resin and is provided with knuckles 30a, 30b, and 30c at the end thereof as seen in Fig. 3A. The supporting plate 3 is therefore connected through hinges to the cover bodies 20 and 21 and the window plate 4 by the action of the above-described knuckles.

The window plate 4 is made of a hard resin and, moreover, is provided with

knuckles 40a, 40b, and 40c at the base end thereof as seen in Fig. 3A. The window plate 4 is connected through hinges with the cover bodies 20 and 21 and the supporting plate 3 by the action of the above-described knuckles.

The window plate 4 is transparent and functions as a half-mirror optical element. More specifically, the window plate 4 is adapted to reflect the reflected image on the original paper 5 mounted on the surface of the supporting plate 3 and also to permit one to see the rear side of the window plate 4.

The construction of the hinged arrangement between the cover plates 20 and 21, the supporting plate 3 and the window plate 4 will now be described with reference to Figs. 3A and 3B. It will be apparent that there is provided at the center a "floating" knuckle 50, which is not a part of the cover plates 20 and 21, the supporting plate 3, the window plate 4 and the knuckles respectively associated therewith. The knuckle 50 is positioned such that the knuckles 21a, 20a, 21b, 30a, 40a and 30b are arranged in order, whereas on the opposite side of the floating knuckle 50 the knuckles 40b, 30c, 40c, 20b, 21c and 20c are arranged in order. These knuckles are provided with ribs and bosses. See Figs. 4-5. Spring chambers 50a and 50b are formed inside the floating knuckle 50, as seen in Fig. 3B, and are separated by a center rib such that the spring chambers 50a and 50b are inserted within the coil springs S, respectively. A shaft 60 passes through the knuckles, such that the cover bodies 20 and 21, the supporting plate 3 and the window plate 4 are connected through the hinges and thus capable of being opened and closed. It will be apparent that the supporting plate 3 is urged toward one side and the window

plate 4 is urged toward the opposite side by the coil springs S.

The positioning mechanism disposed on the transferring device of the present invention will now be described. As seen in Fig. 3B, a locking cap 9, which acts to position the cover bodies 20 and 21 while preventing exposure of the shaft 60, is provided with a resilient protrusion 19. The first knuckle 21a is provided with a gutter 91, as seen in Fig. 4, which is arranged to accommodate the resilient protrusion 90. The second knuckle 20a is provided with gutters 92a and 92b which are arranged to accommodate the leading side portion of the resilient protrusion 90. The gutters 92a and 92b are disposed on the inner face of an opening of the knuckle 20a at opposite positions. The locking cap 9 is adapted to fit inside the knuckles 21a and 20a, and the resilient protrusion 90 is fitted within the gutter 91 of the knuckle 21a at the base end side thereof. The resilient protrusion 90 of the locking cap 9 is fitted within the gutter 92a of the knuckle 20a at the leading end thereof when the cover bodies 20 and 21 are opened, and is disengaged from the gutter 92a of the knuckle 20a and fitted to the gutter 92b of the knuckle 20a when the cover bodies 20 and 21 are closed. In this manner proper positioning between the cover bodies 20 and 21 is accomplished. This same positioning mechanism is disposed on the end portion of the hinge connection portion.

As seen in Fig. 3A, there are provided a concave portion 94a and a convex portion 94b, engaged with each other, on the knuckle 20b of the cover body 20 and the knuckle 40c of the window plate 4. The concave portion 94a and the convex portion 94b function as an engaging mechanism for holding the window plate 4 at an

angle of 60° with respect to the cover body 21 in association with the coil spring S as seen in Fig. 6. In addition, concave portion 95a and convex portion 95b, engaging each other, are disposed on the knuckle 21b of the cover body 21 and the knuckle 30a of the supporting plate 3. The concave portion 95a and the convex portion 95b function as an engaging mechanism for holding the supporting plate at an angle of 60° with respect to the cover body 20, in association with the coil spring S.

Furthermore, there are provided a convex portion 96a and a concave portion 96b, engaged with each other, on the knuckle 30b of the supporting plate 3 and the knuckle 40a of the window plate 4. Still further, a concave portion 97a and a convex portion 97b, engaged with each other, are disposed on the knuckle 30c of the supporting plate 3 and the knuckle 40b of the window plate 4. These concave portions 96b, 97a, and convex portions 96a and 97b function as an engaging mechanism holding the supporting plate 3 and the window plate 4 at an angle of 60° in association with the coil spring S.

The floating knuckle 50 is provided with a pressing element 50a for pressing the original paper 5 at the circumferential face thereof. That is, the pressing element 50a presses the original paper 5 by rotating the floating knuckle 50 around the shaft 60, after the original paper 5 is disposed on the supporting plate 3.

From the foregoing it will be apparent that the supporting plate 3 and the window plate 4 are positioned at 60° with respect to the cover bodies 20 and 21. In this manner special fittings to keep the supporting plate 3 and window plate 4 at predetermined angles are not required. Moreover, in accordance with the principles

of the present invention, the supporting plate 3 and the window plate 4 are able to be folded directly against the cover bodies 20 and 21 when the transferring device is not in use, in this manner permitting the disassembly of the components rapidly for storage and transportation.

It will be apparent that the principles of the present invention may be performed by embodiments not specifically disclosed in the specification and that the structures disclosed herein can be modified without departing from the spirit of the invention. A few examples follow.

CLAIMS

1. A transferring device, comprising a base, a supporting plate, a transparent window plate, hinge means operatively connecting the supporting plate, the window plate and the base permitting opening and closing movement therebetween, first engaging means associated with the supporting plate and base for erecting the supporting plate at a predetermined angle with respect to the base, and second engaging means associated with the window plate and the base permitting the window plate to be erected at a predetermined angle with respect to the base.

2. A transferring device as claimed in claim 1, wherein the hinge means comprises knuckles provided on the supporting plate and window plate, an opening provided within the base, the knuckles passing through the opening, the first engaging means being provided on the knuckle of the supporting plate and the knuckles of the base plate, and the second engaging means being provided on the knuckles of the window plate and the knuckles of the base.

3. In a transferring device having a plate for supporting an original paper, a transparent window plate for reflecting at a surface thereof the reflected image of the original paper, and a base plate supporting the supporting plate and the window plate and capable of positioning the supporting plate and the window plate at predetermined angles wherein a pattern of the original paper is transferred onto a blank paper positioned on the rear face of the window plate by tracing the reflected

reflected image from the front face of the window, the improvement comprising hinges connecting the supporting plate, the window plate and the base plate permitting opening and closing of same, first engaging means associated with the supporting plate and the base plate for positioning the supporting plate at a predetermined angle with respect to the base, and second engaging means associated with the window plate and the base plate permitting the window plate to be erected at a predetermined angle with respect to the base plate.

4. A transferring device substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

5. A transferring device, comprising a base, a supporting plate, a transparent window plate, hinge means operatively connecting the supporting plate, the window plate and the base permitting opening and closing movement therebetween, first engaging means associated with the window plate and base for erecting the supporting plate at a predetermined angle with respect to the base, and second engaging means associated with the supporting plate and the base permitting the window plate to be erected at a predetermined angle with respect to the base.



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Claims searched: 1-5

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Date of search: 6 November 1995

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Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.N): B6P (PB4)

Int Cl (Ed.6): B43L 13/00

Other:

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	US 4191450 (HOGGAN) see Fig 1 and column 2 lines 11-26	1

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.